

### **Amendments To The Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

1. (currently amended) A method for detecting a binding event between at least one binder and members of a receptor array, comprising the steps of:
  - (a) exposing a plurality of binder-free receptors to at least one binder having chemically associated and nonradioactive element detectable by X-ray fluorescence to form at least one bound receptor-binder complex wherein the binder is selected from the group consisting of esters, amines, imines, aldehydes, ketones, amides, ethers, olefins, halogenated organic molecules, antibodies, drugs, hormones, steroids, amino acids, nucleic acids, oligomers, oligonucleotides, oligosaccharides, oligopeptides, polyolefins, polyurethanes, polyesters, polycarbonates, polyamines, polyamides, halogenated polymers, polypeptides, polynucleotides, polysaccharides, nucleic acids, anions, complex ions, oxoanions, polyoxoanions, phosphate, organophosphates, sulfate, organosulfates, zirconate, agonists and antagonists for cell membrane receptors, toxins, enzymes, enzyme substrates, cofactors, and antibodies;
  - (b) washing said bound receptor-binder complex to remove unbound binder from said bound receptor-binder complex;
  - (c) arraying said bound receptor-binder complex onto a substrate; and
  - (d) detecting a binding event by exposing said bound receptor-binder complex to X-ray radiation in order to generate an X-ray fluorescence signal from said detectable element in said bound receptor-binder complex.
2. (original) The method of claim 1, wherein the receptor comprises at least one organic compound.

3. (original) The method of claim 1, wherein the receptor comprises at least one oligomer.

4. (original) The method of claim 1, wherein the receptor comprises at least one polymer.

5. (original) The method of claim 1, wherein the receptor is selected from the group consisting of esters, amines, imines, aldehydes, ketones, amides, ethers, olefins, halogenated organic molecules, antibodies, drugs, steroids, amino acids, nucleic acids, oligomers, oligonucleotides, oligosaccharides, oligopeptides, polyolefins, polyurethanes, polyesters, polycarbonates, polyamines, polyamides, halogenated polymers, polypeptides, polynucleotides, polysaccharides, nucleic acids, cell membrane receptors, viruses, cells, cellular membranes, and organelles.

6. (original) The method of claim 1, wherein the binder comprises at least one organic molecule.

7. (original) The method of claim 1, wherein the binder comprises at least one oligomer.

8. (original) The method of claim 1, wherein the binder comprises at least one polymer.

9. (canceled)

10. (canceled)

11. (currently amended) A method for detecting chemical binding between at least one binder and members of a receptor array, comprising the steps of:

- (a) exposing a plurality of binder-free receptors to at least one untagged binder having a chemically associated and nonradioactive element detectable by X-ray fluorescence to form at least one bound receptor

wherein the binder is selected from the group consisting of esters, amines, imines, aldehydes, ketones, amides, ethers, olefins, halogenated organic molecules, antibodies, drugs, hormones, steroids, amino acids, nucleic acids, oligomers, oligonucleotides, oligosaccharides, oligopeptides, polyolefins, polyurethanes, polyesters, polycarbonates, polyamines, polyamides, halogenated polymers, polypeptides, polynucleotides, polysaccharides, nucleic acids, anions, complex ions, oxoanions, polyoxoanions, phosphate, organophosphates, sulfate, organosulfates, zirconate, agonists and antagonists for cell membrane receptors, toxins, enzymes, enzyme substrates, cofactors, and antibodies;

- (b) washing said bound receptor;
- (c) arraying said bound receptor onto a substrate; and
- (d) detecting an X-ray fluorescence signal generated by said detectable

element in said bound receptor.

12. (previously presented) The method of claim 11, wherein the receptor comprises at least one organic compound.

13. (previously presented) The method of claim 11, wherein the receptor comprises at least one oligomer.

14. (previously presented) The method of claim 11, wherein the receptor comprises at least one polymer.

15. (previously presented) The method of claim 11, wherein the receptor is selected from the group consisting of esters, amines, imines, aldehydes, ketones, amides, ethers, olefins, halogenated organic molecules, antibodies, drugs, steroids, amino acids, nucleic acids, polyurethanes, polyesters, polycarbonates, polyamines, polyamides, halogenated polymers, polypeptides, polynucleotides, polysaccharides, nucleic acids, cell membrane receptors, viruses, cells, cellular membranes, and organelles.

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| 16. (previously presented) | The method of claim 11, wherein the binder comprises at least one organic molecule. |
| 17. (previously presented) | The method of claim 11, wherein the binder comprises at least one oligomer.         |
| 18. (previously presented) | The method of claim 11, wherein the binder comprises at least one polymer.          |
| 19. (canceled)             |   |
| 20. (canceled)             |   |